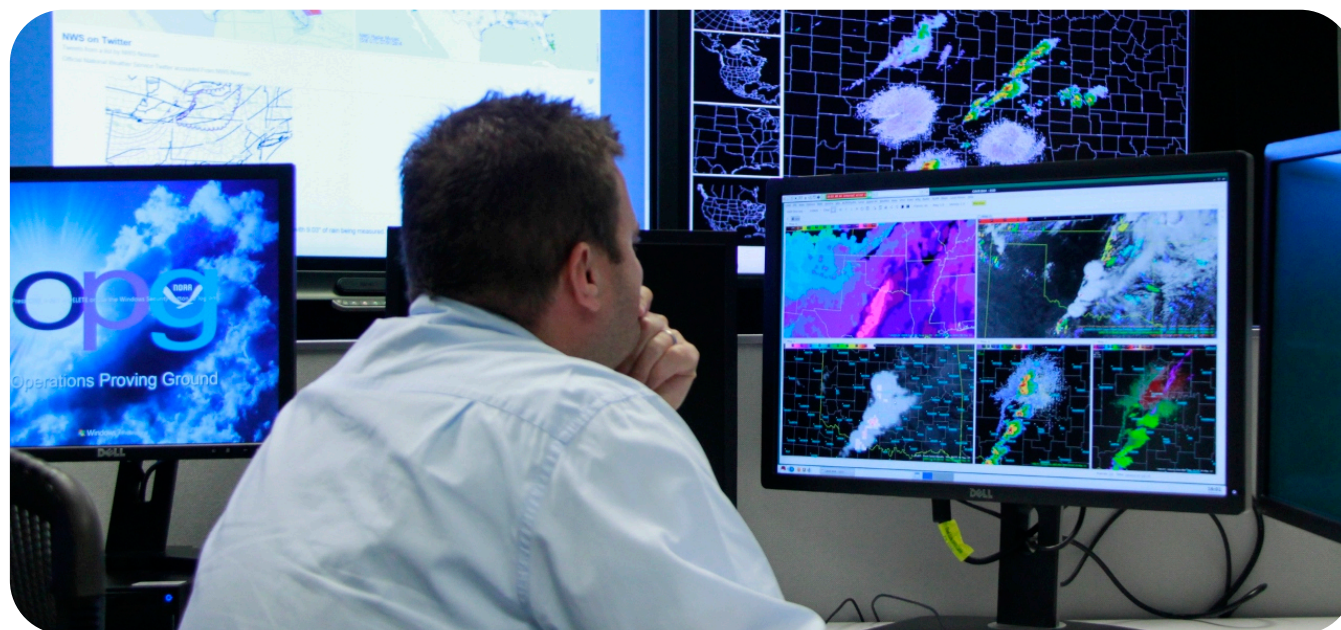


Testbed Roundup Briefing

Operational Readiness Evaluations in 2015

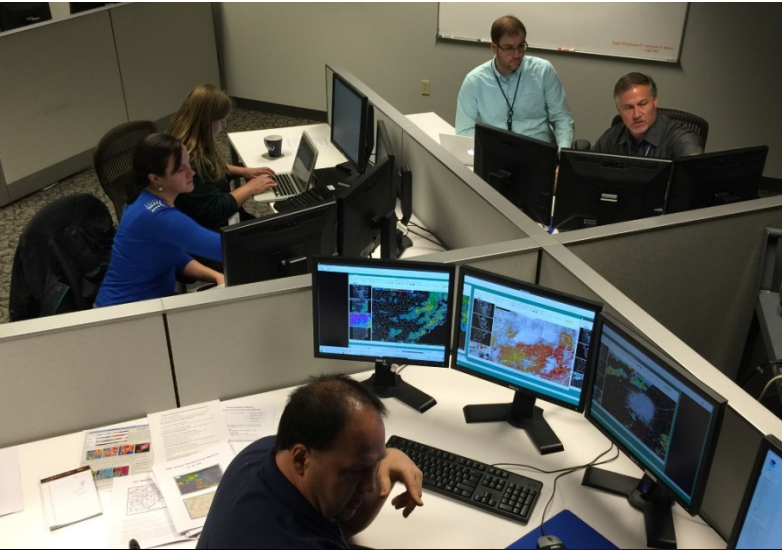
Kim Runk and Chad Gravelle



April 14, 2015

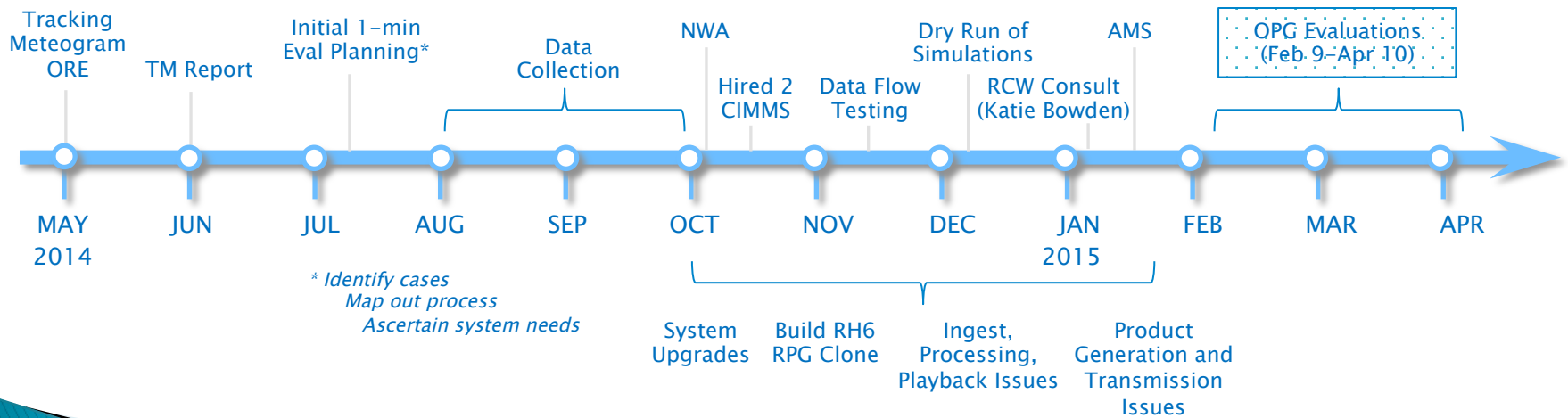
Purpose & Role in R2O Process

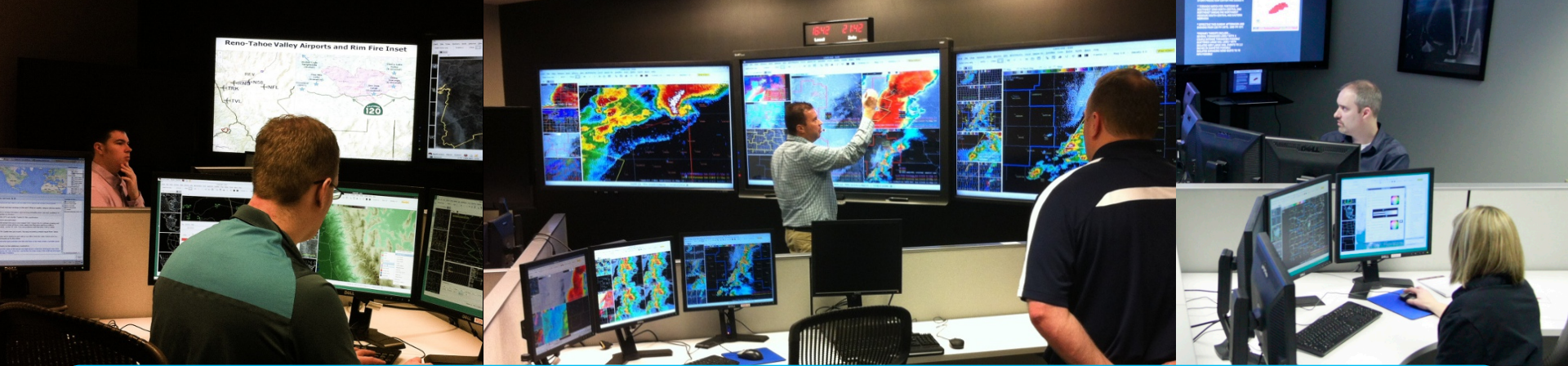
- ▶ Complement Testbeds
- ▶ Conduct “Last Mile” Evals
- ▶ Realistic Operational Setting
- ▶ Live or Historical Data
- ▶ Prototype Future Systems



Since Last TBPG Meeting

- ▶ Completed Phase 1 of Systems Build-up Plan
- ▶ Developed Innovative Playback Capability
- ▶ Conducted First Successful R2O Project
- ▶ Concluded Comprehensive User Evaluation Sessions in Preparation for GOES-R



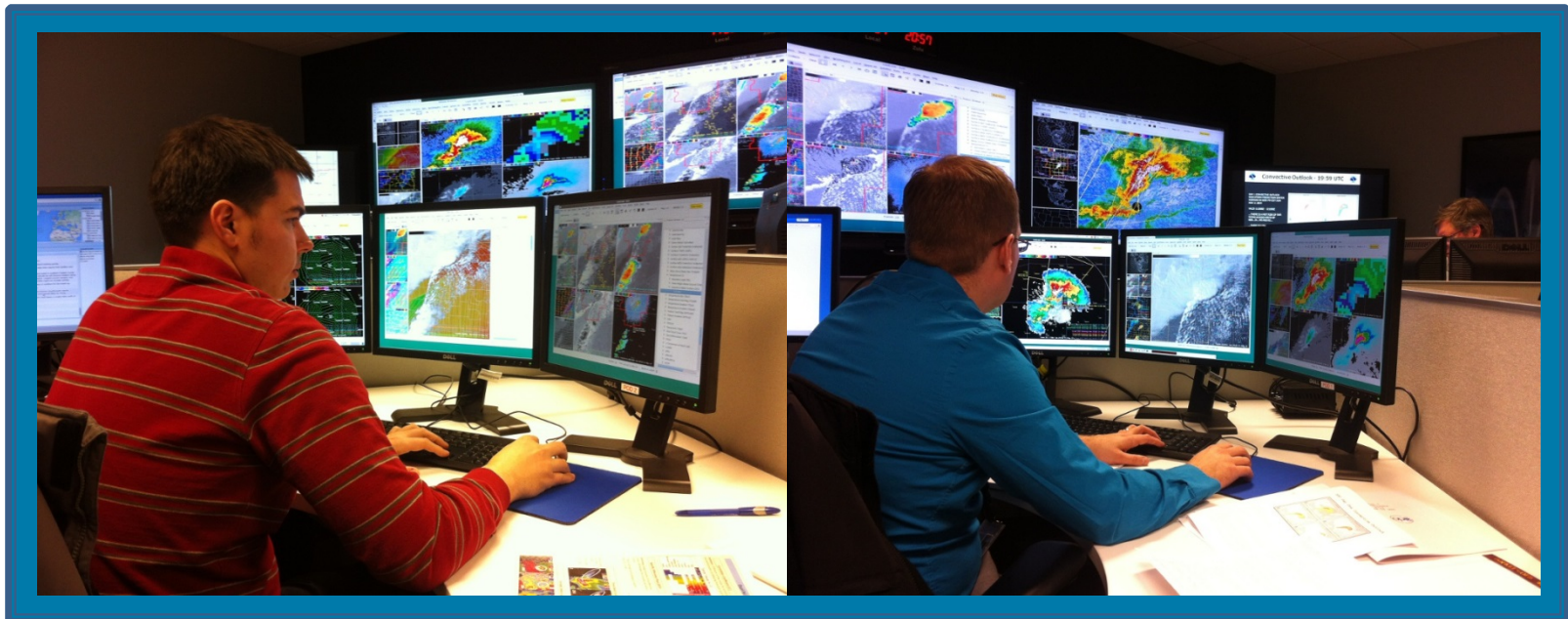


1-minute Imagery Evaluations at the OPG



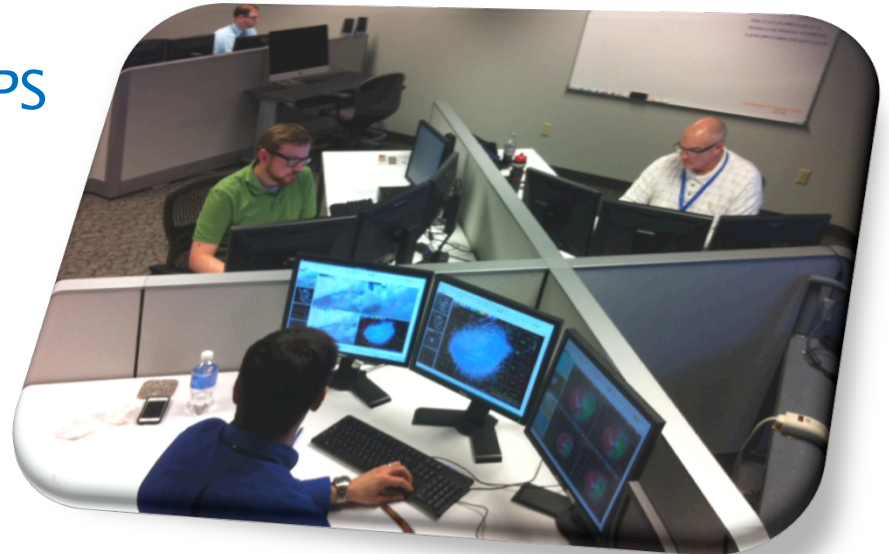
1–Minute Evaluation Goals

- ▶ Assess the Usefulness of 1–minute & 5–minute Satellite Imagery in NWS WFO Operations
 - *Variety of Analysis, Forecast, and Warning Tasks*
 - *Ability to Assimilate Data into Decision Making*
 - *Direct Decision Influence + Adding Confidence*
 - *Identify Potential Workload, Work Flow Issues*



Developing a Realistic Simulation

- ▶ AWIPS–II Playback and Product Generation Capability
 - RPG Clone, Ingest Scripts
 - WarnGen, Text Editor, AvnFPS
- ▶ Foundational Data Sets
 - Satellite Imagery
 - Base Radar Files
 - Model Output
 - Observations
 - Raw Lightning + Metadata
- ▶ Method of Providing “Spotter Reports”
- ▶ NWSChat Rooms for “Partner Interaction”
- ▶ Careful Planning: Assigned Task / Distractor Balance



Decision Making Assessments

▶ Decision Logs and Written Survey

- Type of Decision
- Reasons for Decision
- Confidence in Decision

▶ RCW Methodology

- Recorded Desktop
- Review Decision Logs
- 3 Sweeps to Refine

▶ Keystroke Counter

▶ Group Debriefs

- Intentional Training Moments

Simulation 7 Decision Log

Record any decisions or actions that you make while going through the simulation.

Time (UTC) decision was made (in reference to the simulation):

Decision:*

- ☐ Mesoanalyst Communication
- ☐ AFD Update
- ☐ NWSSchat Communication
- ☐ Social Media Post
- ☐ Short Term Forecast
- ☐ DDS-Related Activity
- ☐ Tornado Warning
- ☐ Severe Thunderstorm Warning
- ☐ Flash Flood Warning
- ☐ Severe Weather Statement
- ☐ Special Weather Statement
- ☐ Flash Flood Statement
- ☐ Other:

If you would like to write it in the following:

On a scale of 1-10, how confident were you in the decision made?*

- ☐ 1
- ☐ 2
- ☐ 3

Recent Case Walkthrough Prompting

Probing Questions for Each Decision:

1. What sources of information (e.g., radar, satellite, model) did you use to make this decision?
2. How did you use this information (e.g., radar, satellite, model) in your decision?
3. What were you looking for (e.g., criteria, trends, specific threats) in this decision? (only if not specified in responding to question 2)
4. Did satellite imagery or algorithms influence this decision and if so, how?
5. What factors contributed to your confidence rating for this decision?

Overall Probing Questions:

1. Have you ever encountered this type of weather event before?
2. How does this case compare to the range of experience you have in operations?
3. Can you describe the typical and atypical work habits you encountered during this simulation?
4. How did you setup your workstation for this simulation?
5. Did you integrate or fuse different sources of information to improve your situation during this simulation?
6. What other sources of information (e.g., radar, satellite, model data) helped with your decisions?

▶ Training Sim:

- *Minneapolis area*

▶ Sim 1: Kansas City

- *Aviation, DSS, AFD*

▶ Sim 2: Reno/Sac.

- *Wildfire, Aviation, AQ*

▶ Sim 3: Kansas City

- *Warning Forecaster (SVR/TOR event)*

▶ Sim 4: Bay Area

- *Aviation Forecasting*

▶ Sim 5: Raleigh

- *Mesoanalyst*

▶ Sim 6: Las Vegas

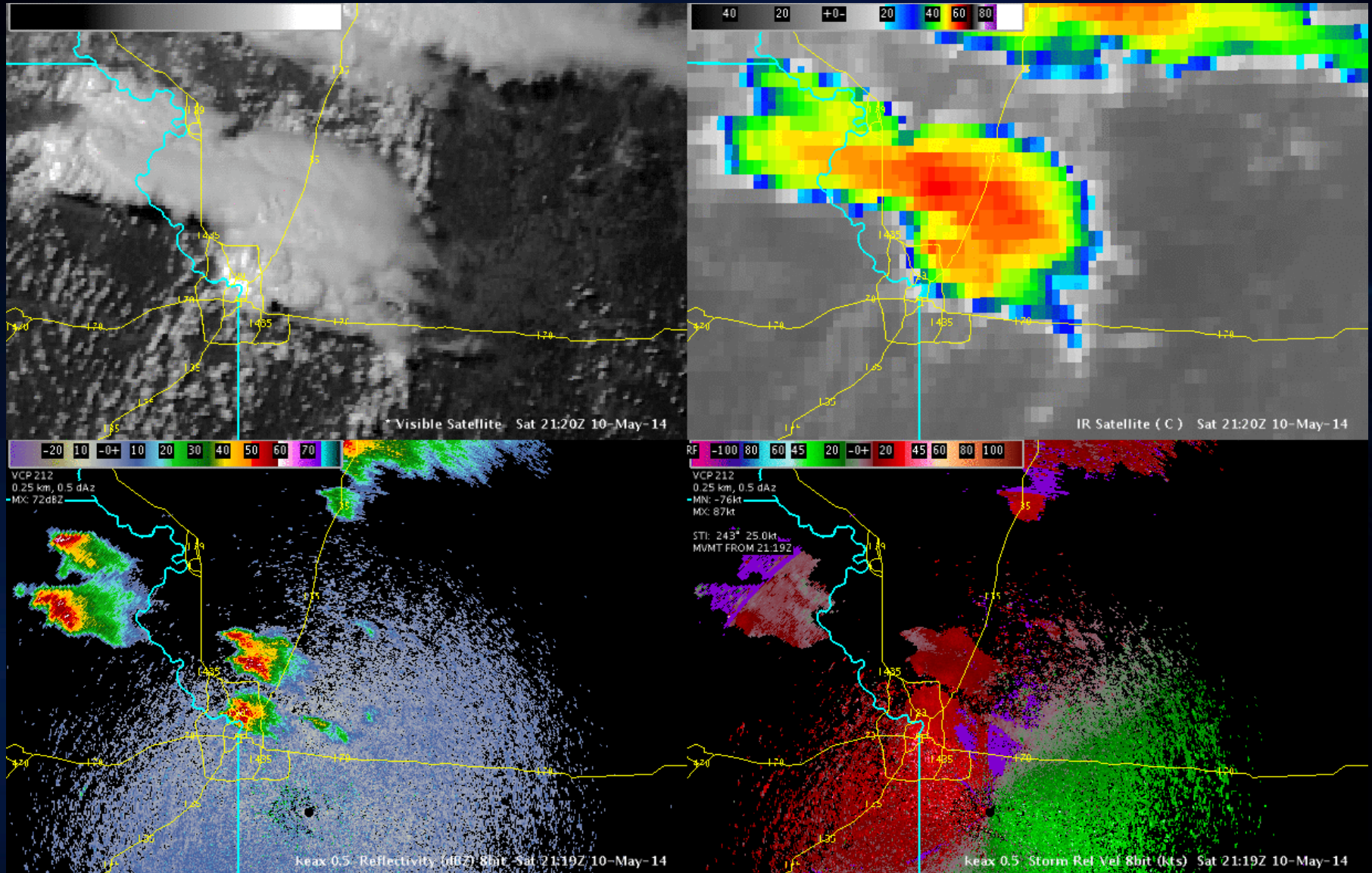
- *FFW/Advisories*

▶ Sim 7: Hastings

- *Collaborative Team
Warning Performance*

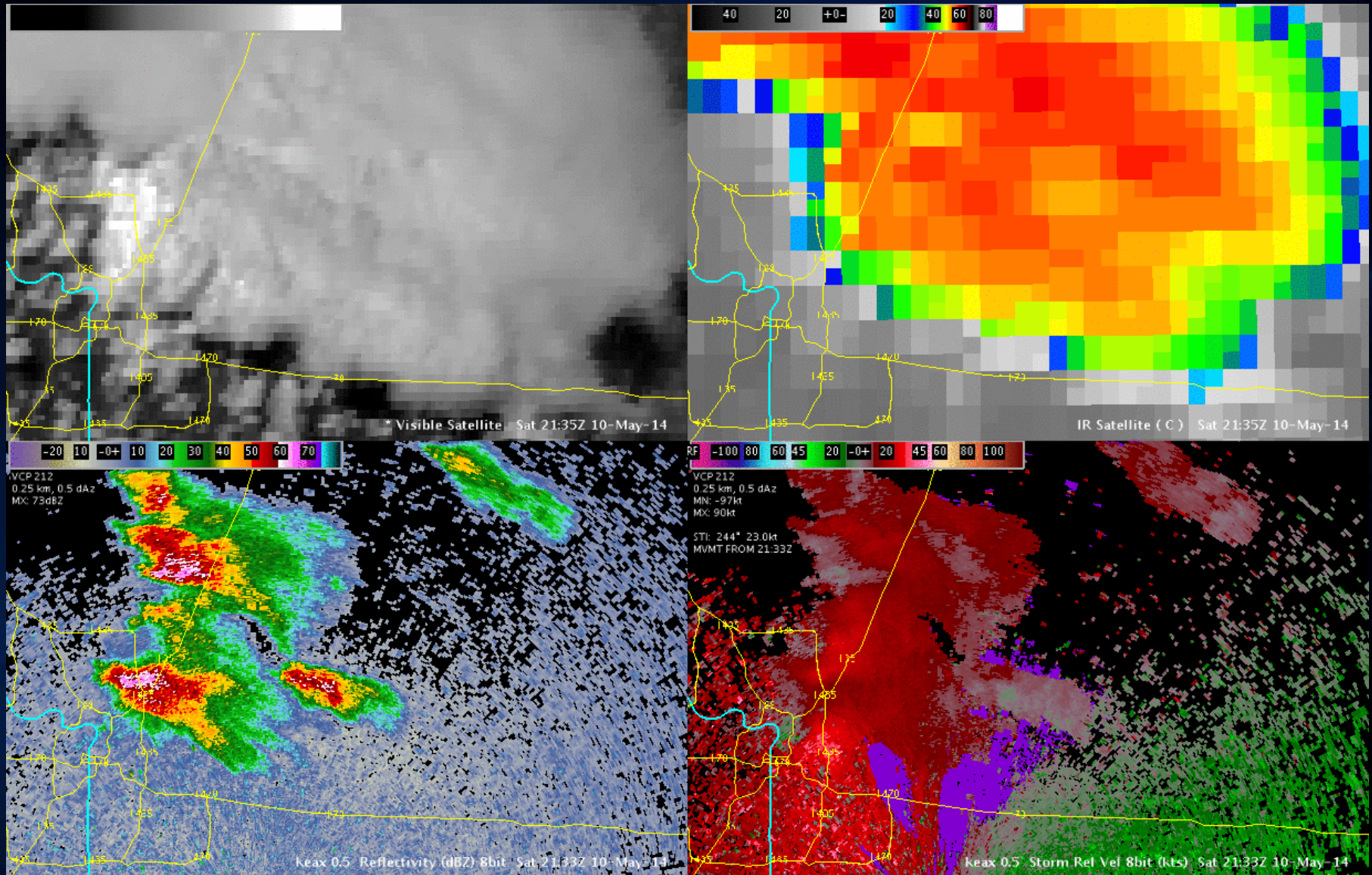
- **8 simulations, 7 locations, 17 forecasters over 6 weeks**
- **Convective and non-convective warning/forecast tasks**
- **Mix of individual assignments and collaborative roles**

Forecaster Observations



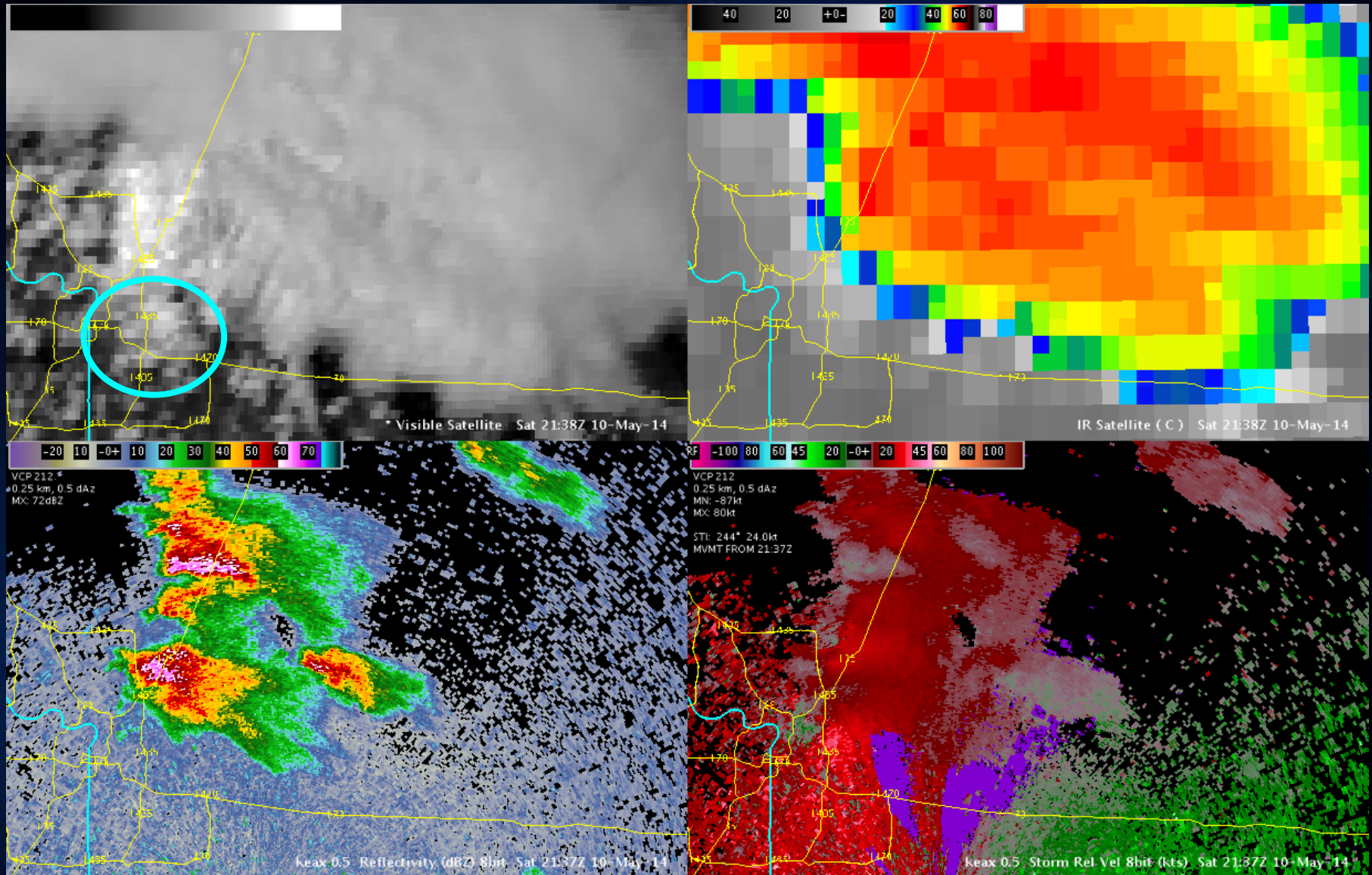
2120-2230 UTC 10 May 2014

1-minute Satellite Imagery



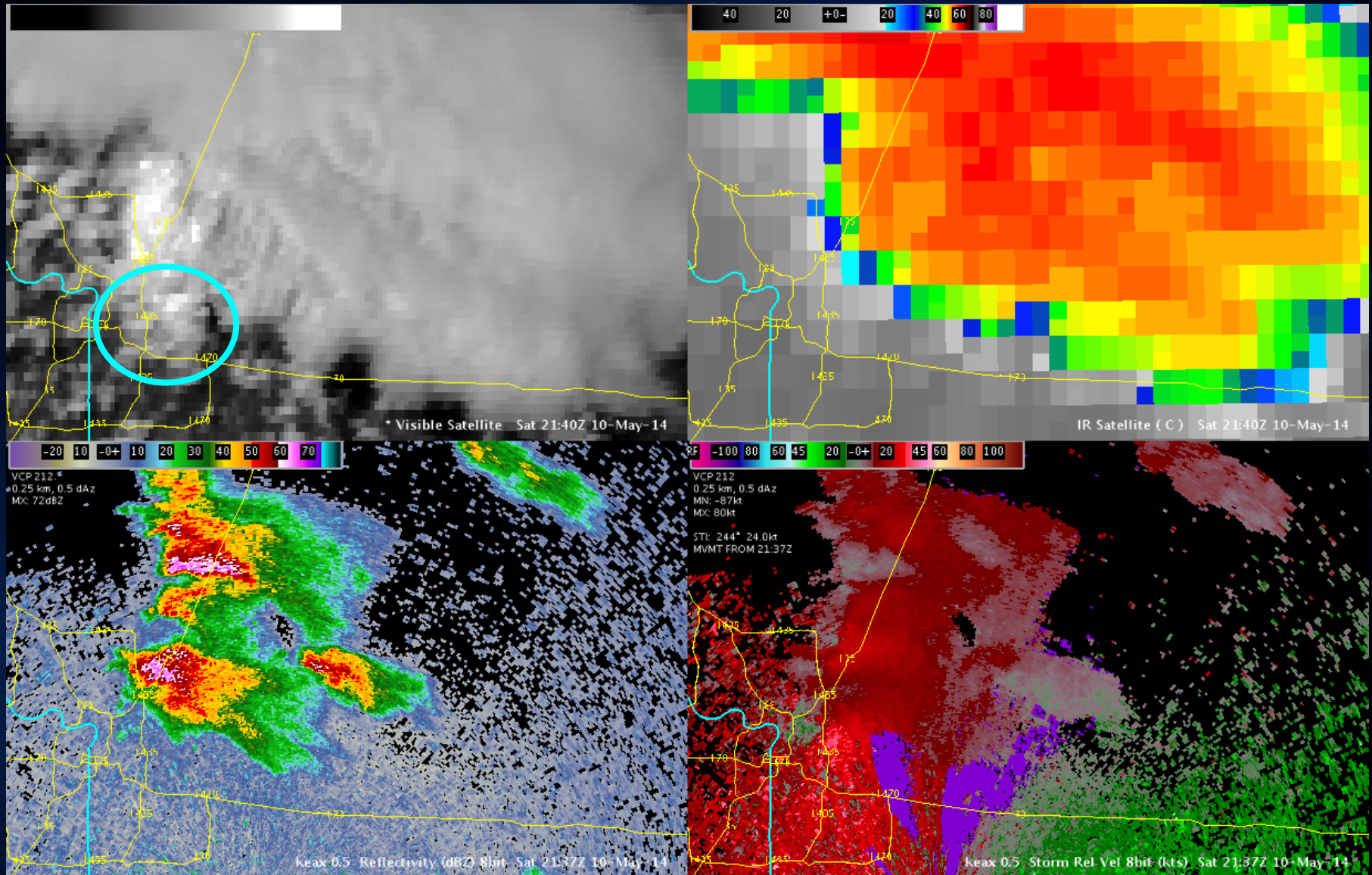
2135-2159 UTC 10 May 2014

1-minute Satellite Imagery



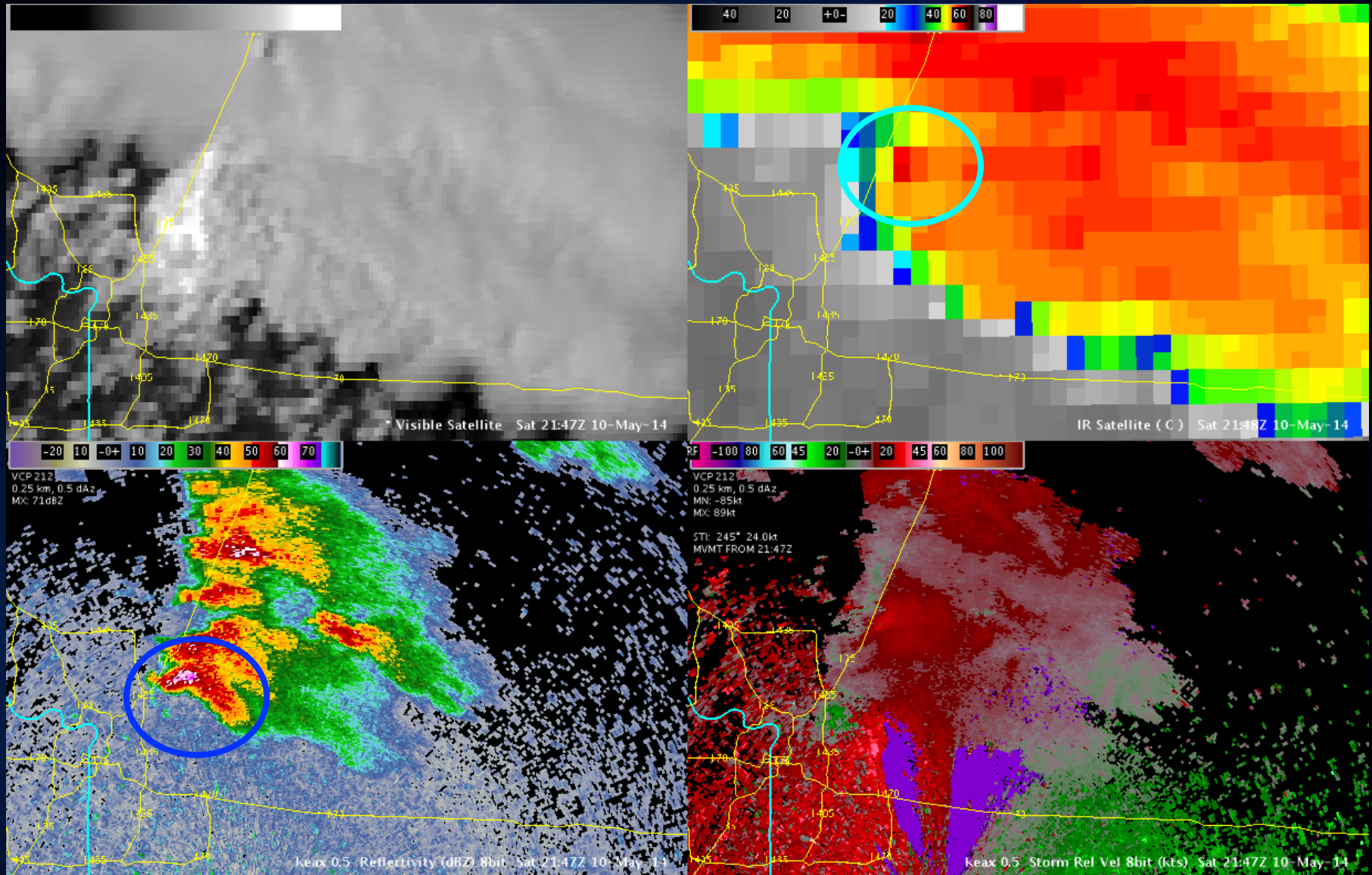
2138 UTC 10 May 2014

1-minute Satellite Imagery



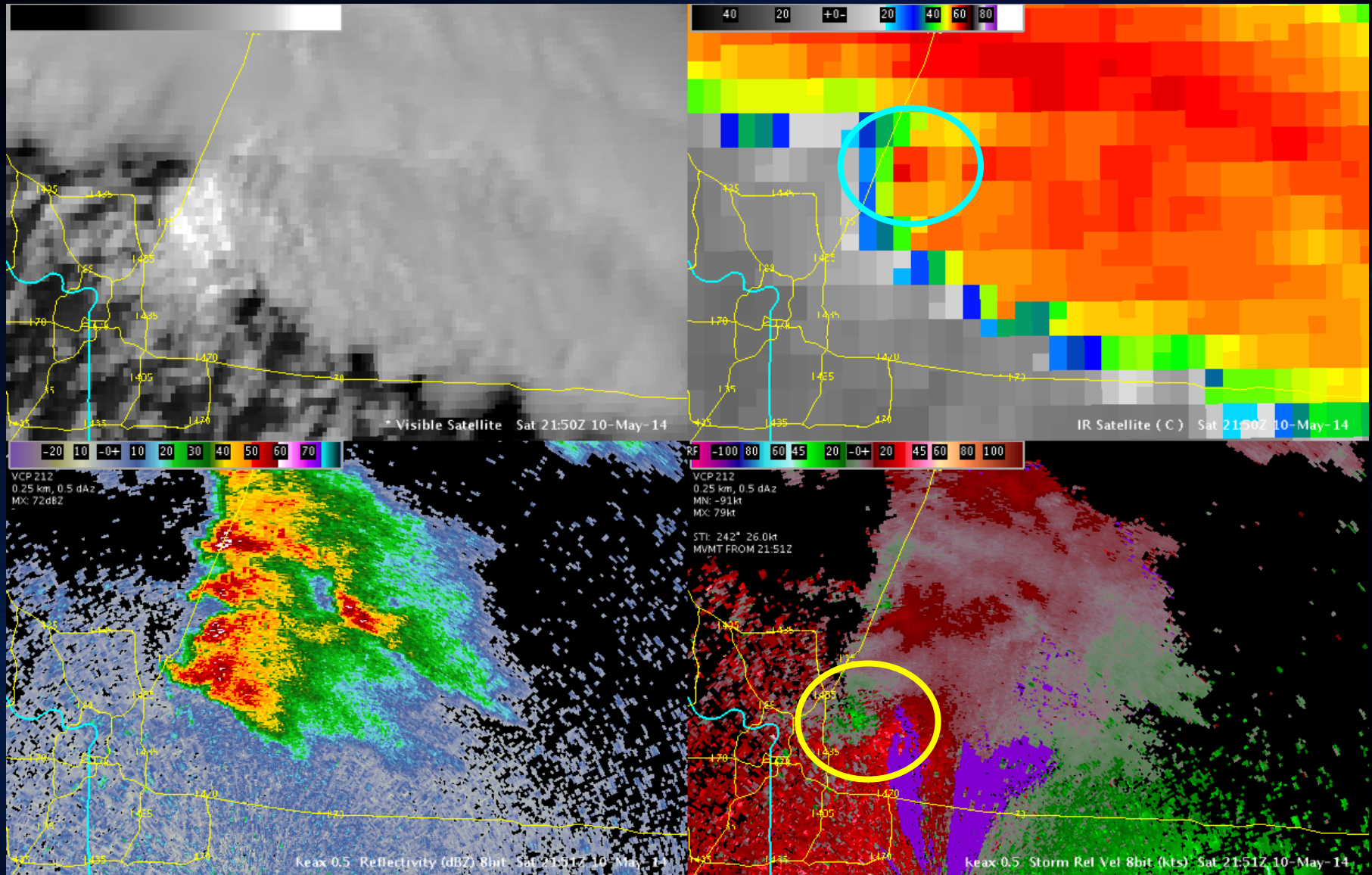
2140 UTC 10 May 2014

1-minute Satellite Imagery



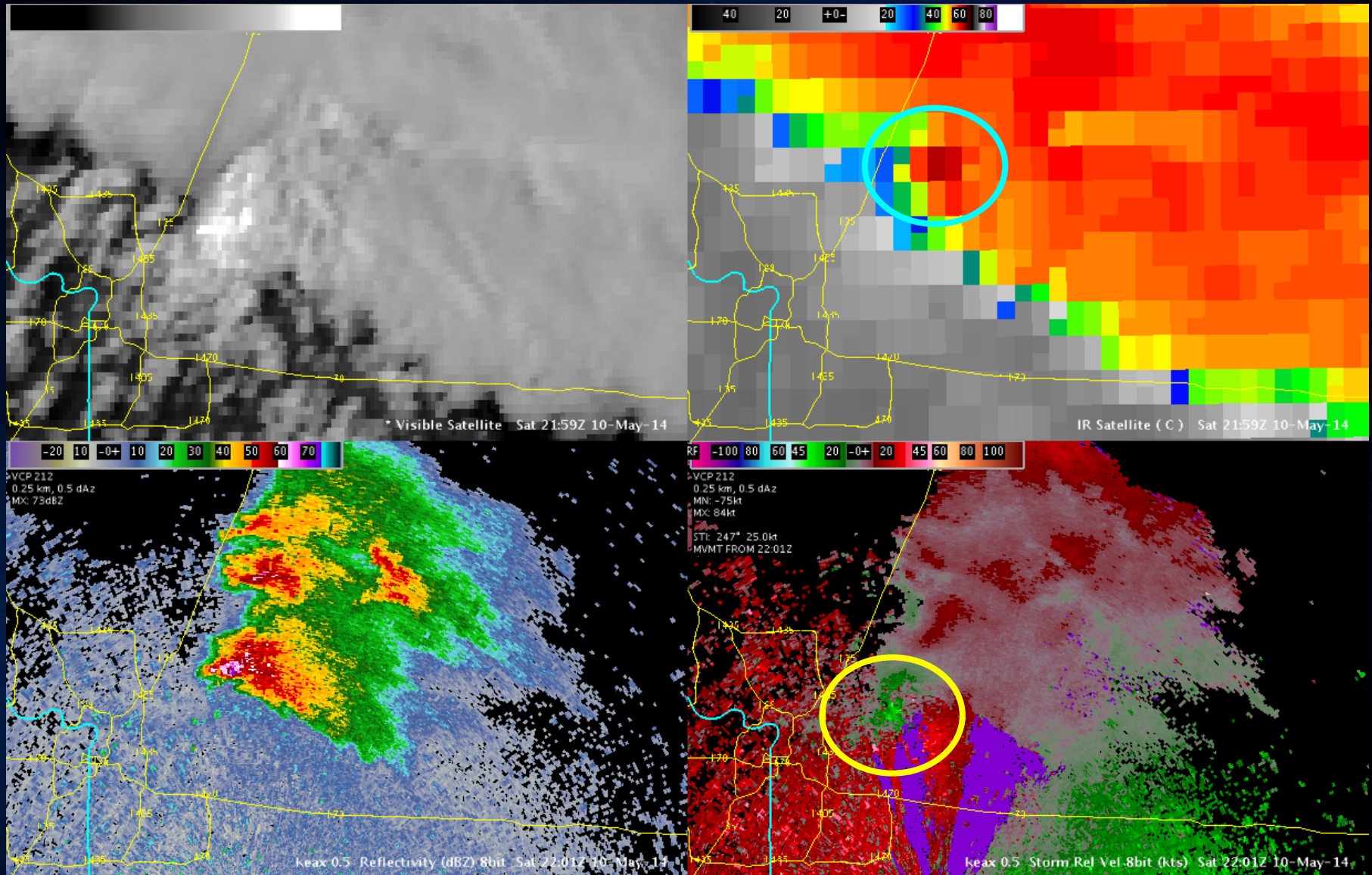
2147 UTC 10 May 2014

1-minute Satellite Imagery



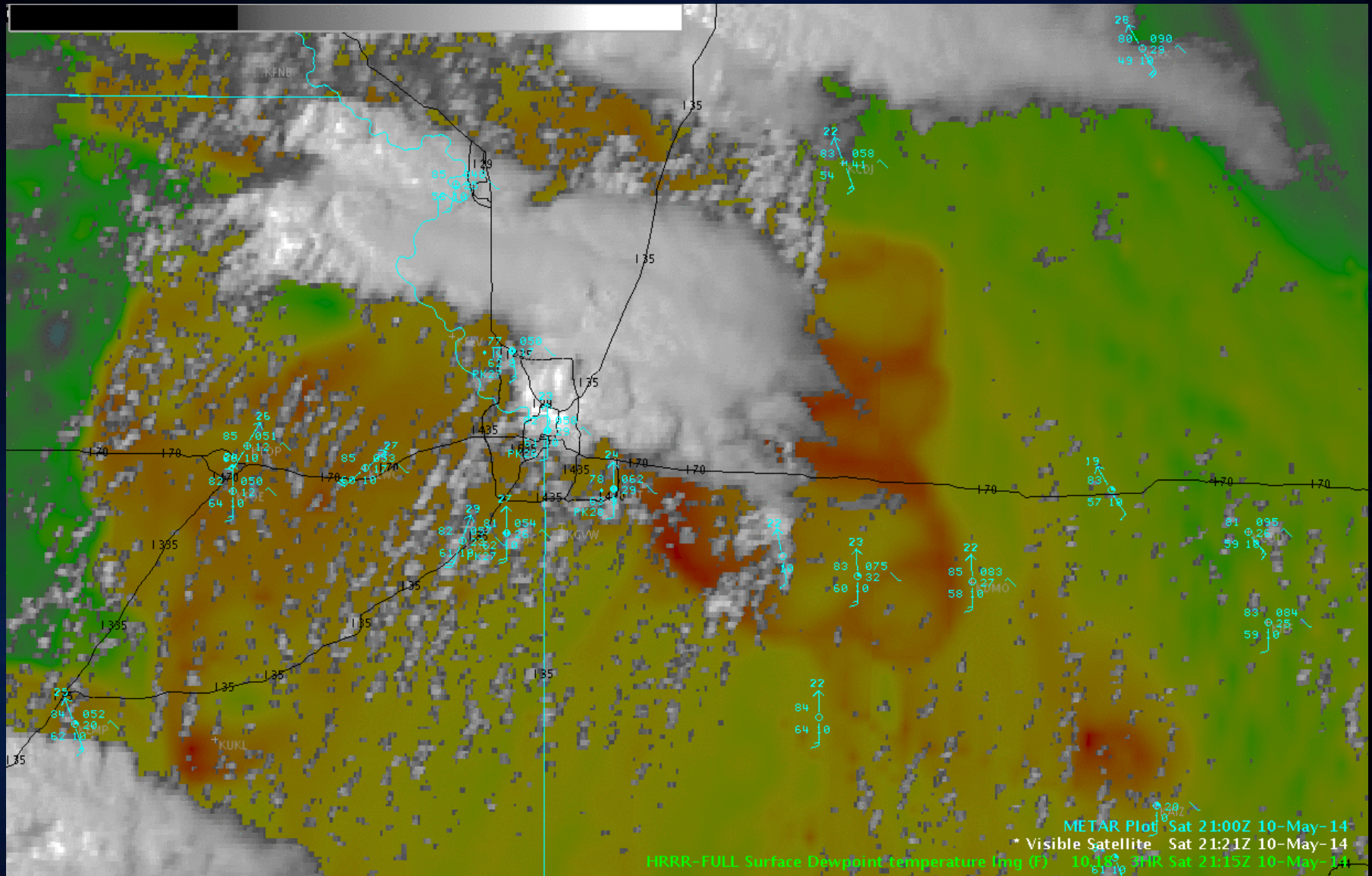
2150 UTC 10 May 2014

1-minute Satellite Imagery



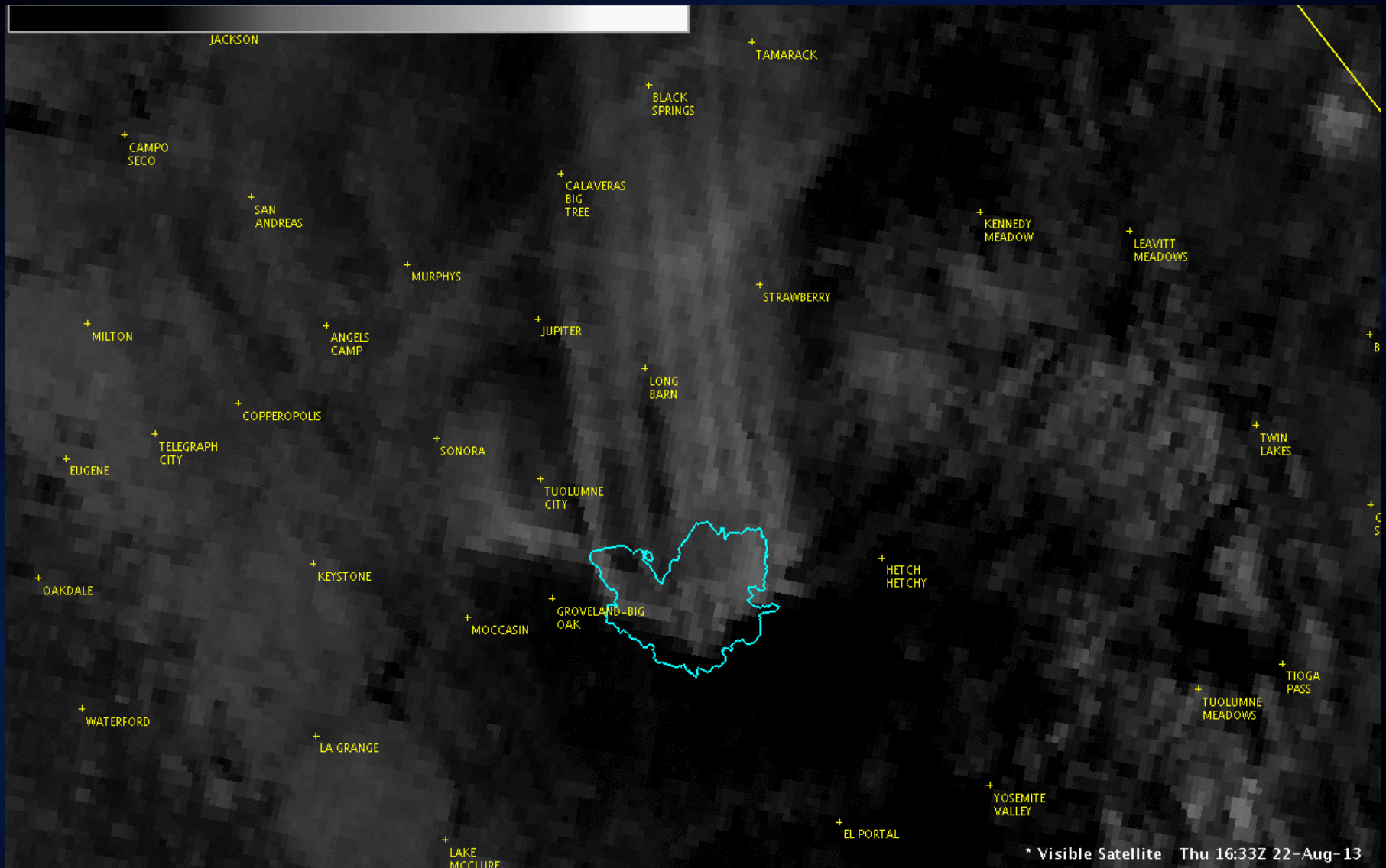
2159 UTC 10 May 2014

1-minute Satellite Imagery



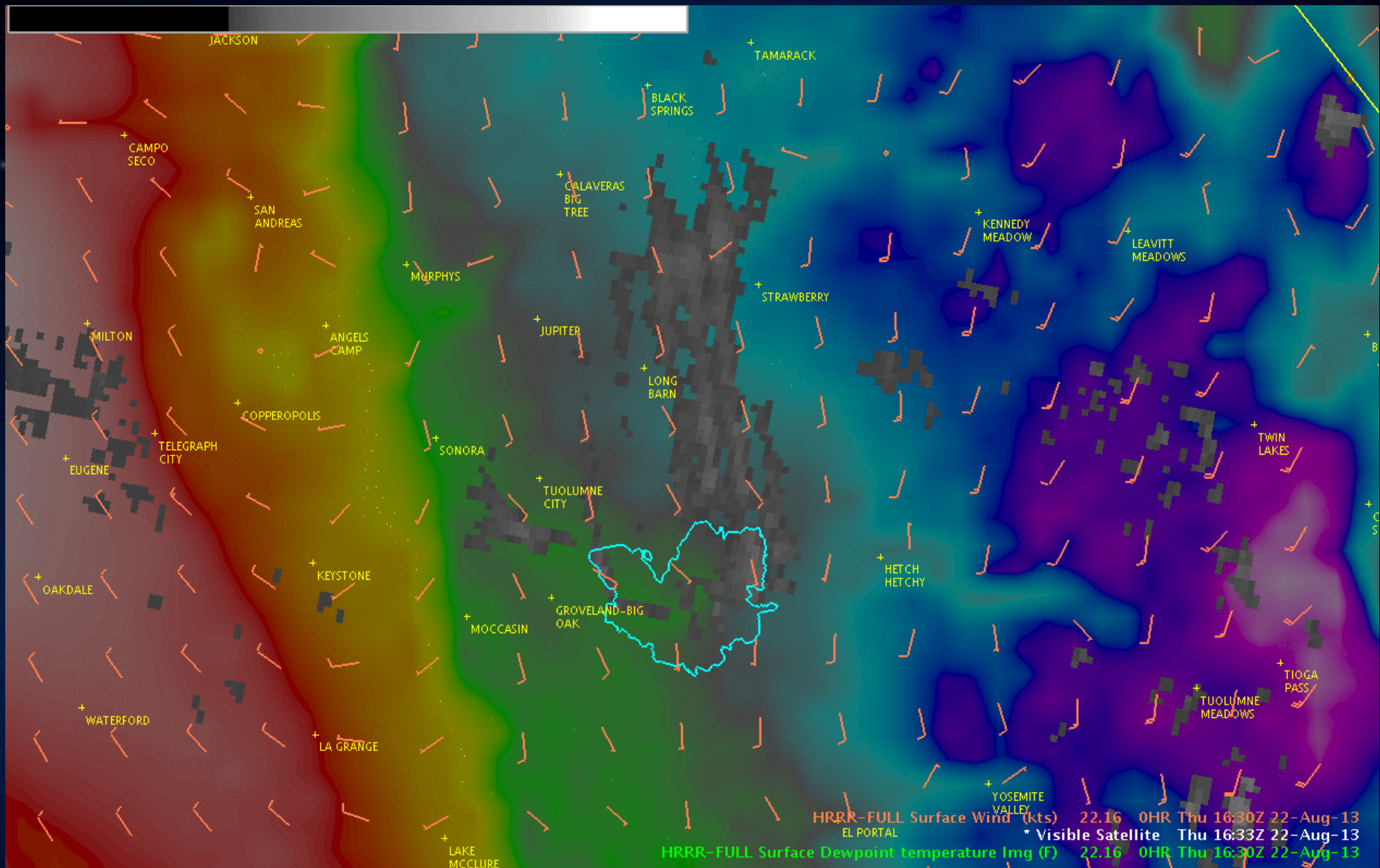
2121-2230 UTC 10 May 2014

1-minute Satellite Imagery



1630-1750 UTC 22 Aug 2013

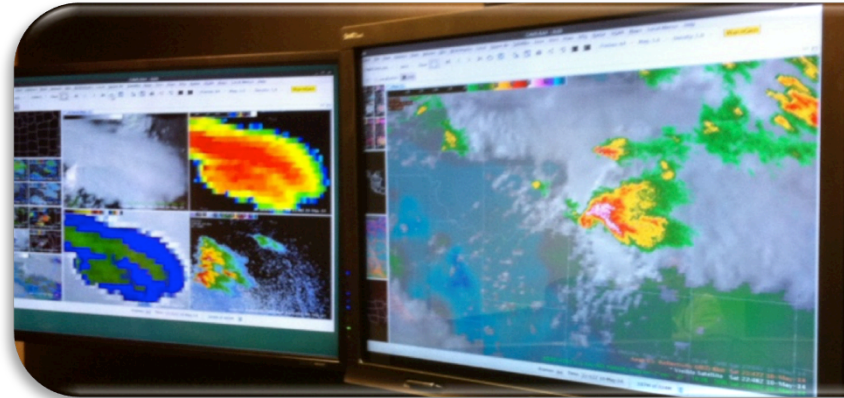
1-minute Satellite Imagery



1630-1750 UTC 22 Aug 2013

Preliminary Results

- ▶ **Strong, unanimous opinion:** Access to 5-minute imagery, time-matched to radar data offers dramatic improvement over existing capabilities.



Today, satellite imagery is not practical for many tasks, owing to latency issues, as well as temporal and spatial resolution.

- ▶ **Majority preference** (13/17): 5-minute default scan strategy; 1-minute domains activated “on demand”.

Concerns over process by which these activations will be determined and adjudicated.

(Default: Mode 4; Mode 3 upon demand)

Preliminary Results



Situations Where 1-minute Imagery Adds Critical Value

Unanimous Agreement

- Mesoanalysis Role
- Support to Large Wildfires
- Convective Initiation
- Sparse Radar/Obs Coverage
- Enhanced Confidence for Warning Decisions*

Strong Agreement

- Aviation Forecasting Tasks (e.g., fog, low ceilings)

Disagreement

- Direct Assimilation by Convective Warning Forecaster

** A few forecasters expressed the opinion that some convective warning decisions might be accelerated*



Evaluation Schedule

- GOES-R
 - GOES-14 SRSOR RT Evaluation
 - Himawari – ABI User Readiness
 - DOE – Validate Ingest, Integration
- Hazard Services Evaluation
 - Operational Hydro Warning Tests
 - Dependent on Software Maturity
- Secondary Virtual EDEX
 - Improve ORE Capabilities
 - Explore Viability for WFO Training
- Potential Upcoming Projects
 - Digital Aviation Services
 - Hazard Simplification
 - Relevant CSTAR Projects



Three Up, Three Down



Two Operational Evaluation Projects Completed



Breakthrough Playback Capability Developed



Full Schedule, Growing Awareness and Interest



Staffing: Director, ITO = Most Critical



Testbeds/OPG Roles, Pathways



Planning/Execution Process





opg

Operations Proving Ground



Back-Up Slides

opg staff

NAME	POSITION
Kim Runk	Acting Director (NWS)
Chad Gravelle	Chief Met/Science Coordinator (GOES-R, UW CIMSS)
Derrick Snyder	Applications Development Met (OU CIMMS)
Katie Crandall	Risk Comm/Societal Impacts Met (OU CIMMS)
Jack Richardson	Systems Engineer (NOAALink contract with SID)

opg - FY16

PROJECT NAME / PURPOSE	PARTNERS
ABI User Readiness and Training Dev	STI, Pacific Region, GOES-R
Hazard Services Integrated Warning Tool	AWIPS PO, GSD, HSD
Virtualized AWIPS - Secondary Back-End	AWIPS PO, CRH SSD
Several pending VLab, CSTAR projects	SSDs, STI, TBPGCC
Potential dev projects via HWT (e.g., NSEA)	HWT, TBPGCC